

CMX χ^2 (position only) from
data.



Slava Krutelyov

Texas A&M

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Muon Offline Meeting



Setup description.

- Use data to construct sound (centered at 0, width 1, good gaussian fit) pull distributions:
 - 4.9.1hpt1 data used for the 4.9.1 based analyses. MExtrapolator has dX not centered at 0 – partially correcting for that (the largest/easiest contributions). Also observed dX phi dependence – attribute to Nort E/W arches misalignment $\sim 1''$.
 - The misalignments/offsets are becoming important at high pT. The effect is also hard to measure due to low statistics.

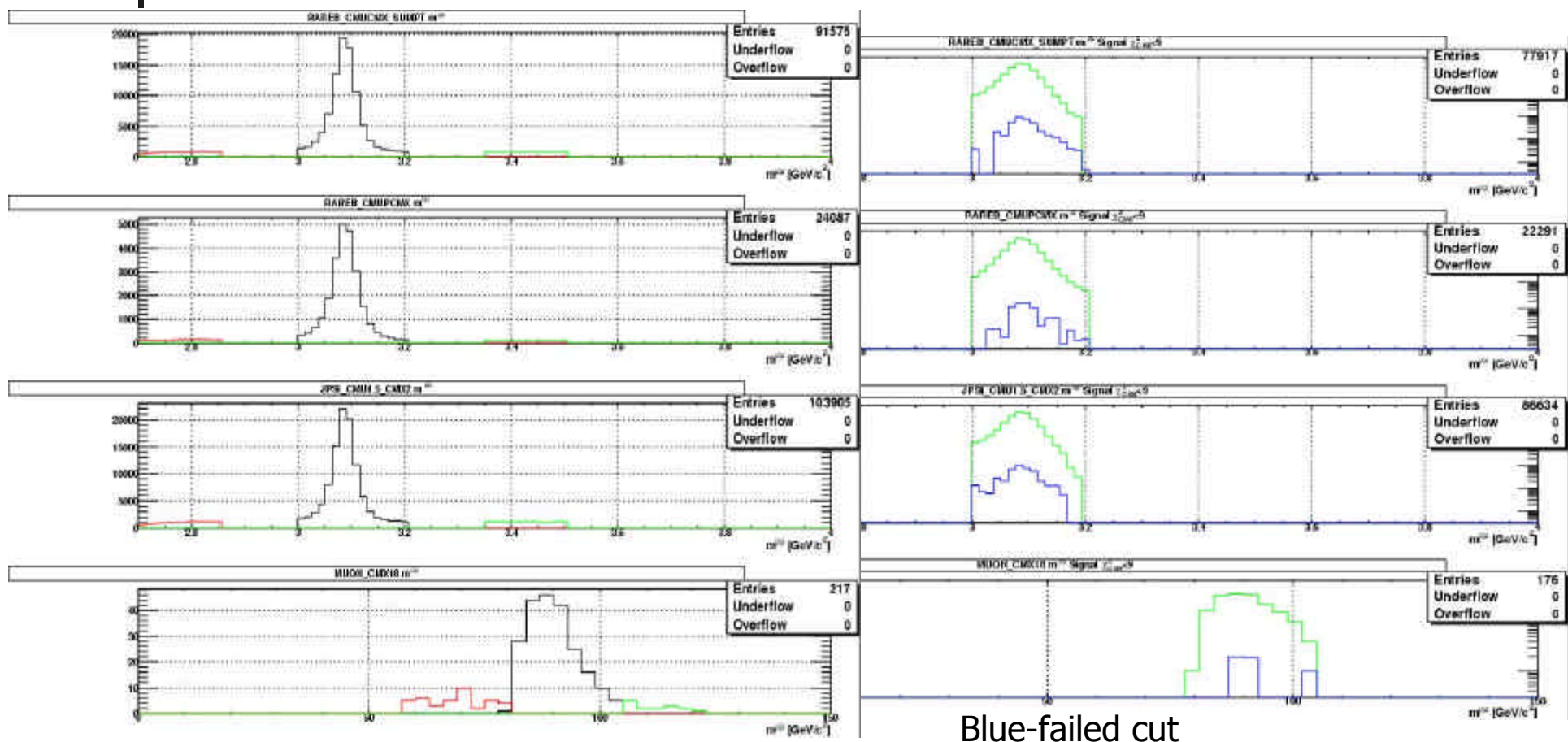


Data sets and cut selections.

Overall:

- 4.8.4 processed data.
- Good runs (CMUCMPCMXSVX), run#>150145
- Muons/events considered by L3 trigger bits separately. Trigger pair is selected based on the L3 cut applied to the event on offline quantities.
- Muon quality: StHits>15, AxHits>19; chi2(CMU)<9 [if leg exists]. CMU W17 muons dropped. |Z0|<60cm. IMU not considered. Stubless muons included.
- Use signal window events to obtain the dX sigma parametrization/fit. Check the pulls (inclusive) after sideband subtraction.
- J/psi: ($\sim 1e5$ J/psi)
 - jbot0h, jpmm08.
- Z: (~ 200 Zs)
 - bhmu08. Apply R4 calorimeter isolation < 1GeV on both legs, take back-to-back events only (dPhi>2), |d0|<0.2cm, |dZ0|<1cm

Results: Mass distribution.

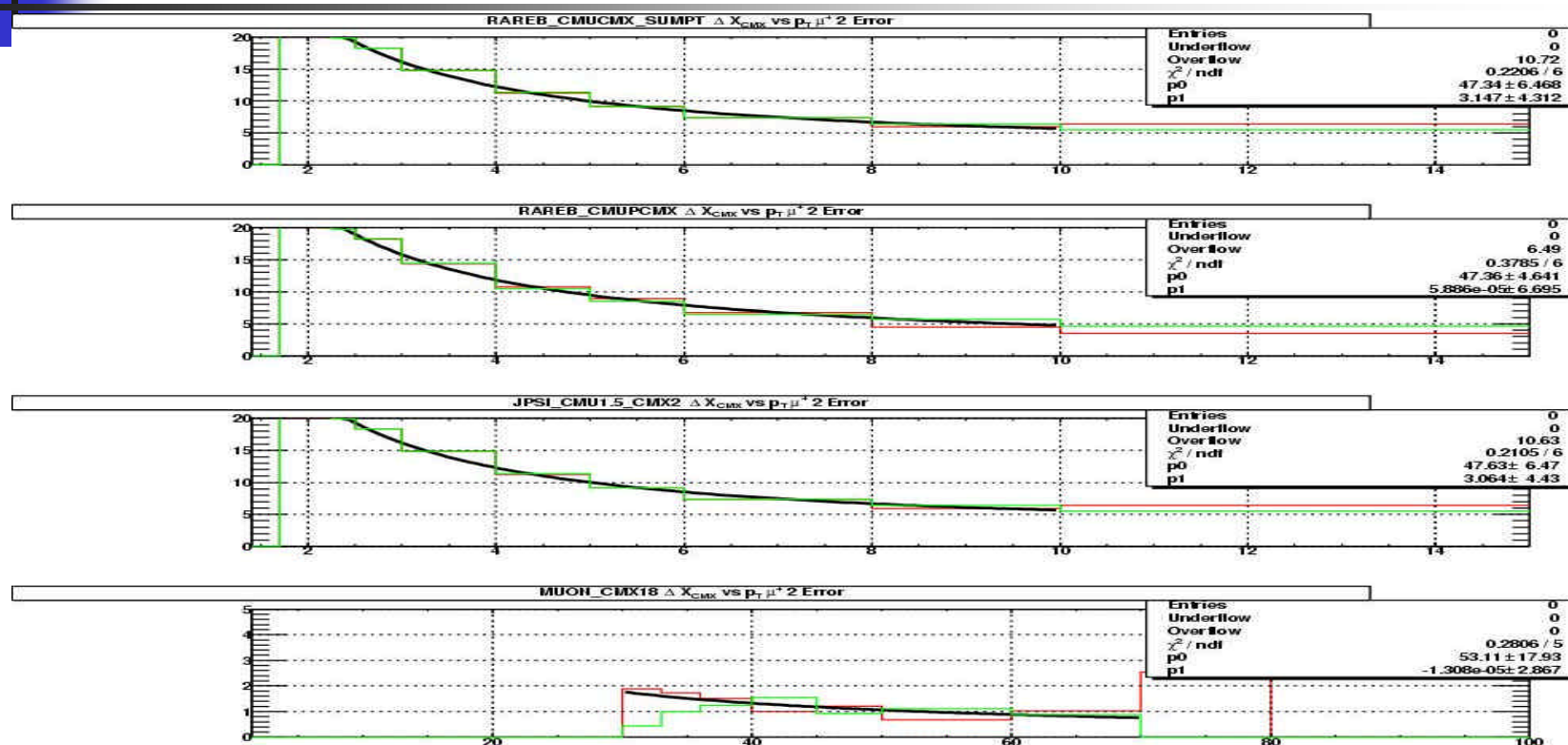


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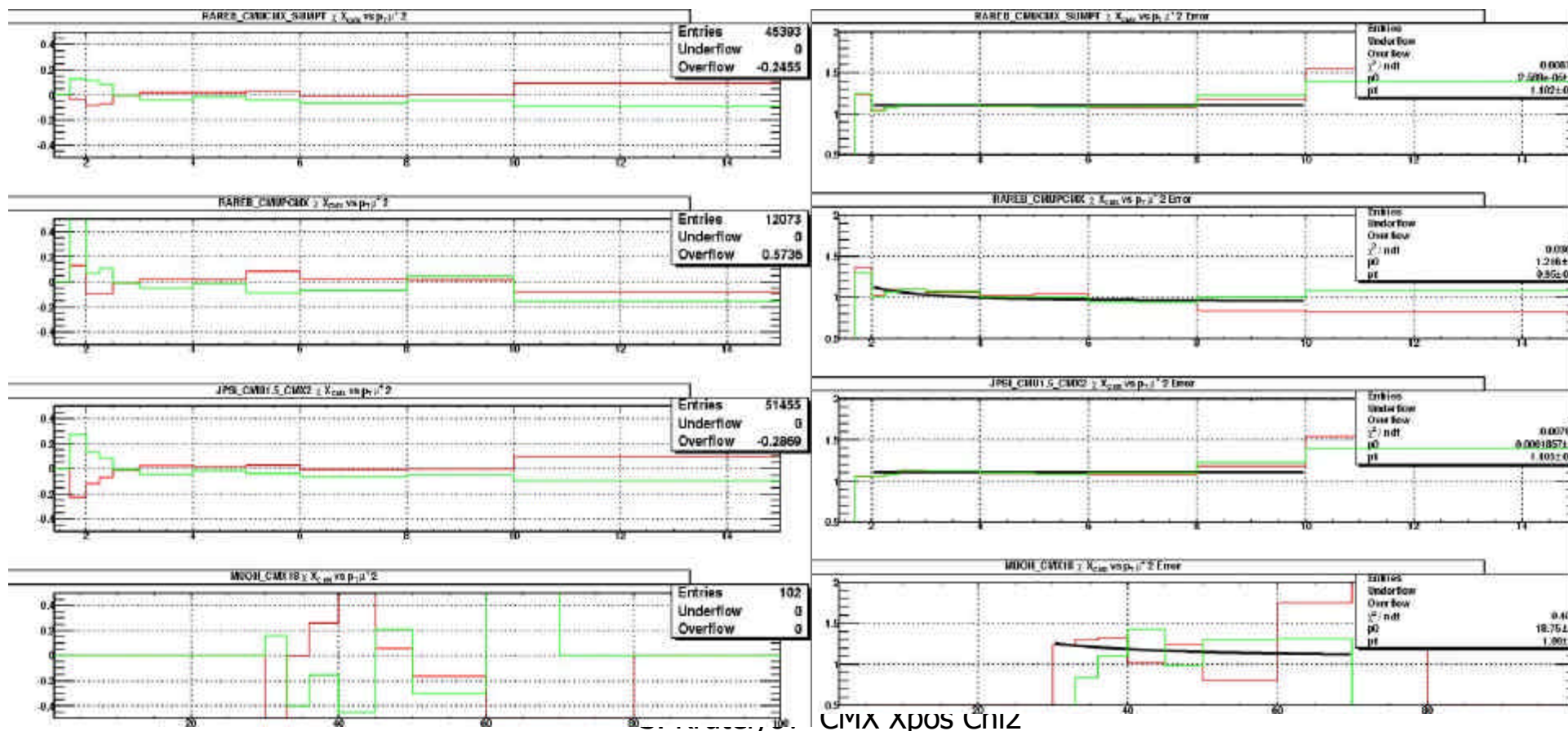
Results: dX error parameterization



- $\sqrt{46.5^2 \cdot (1.75 - 0.97 \cdot |\eta_{CMX}|)^2 / p_{T,CMX}^2 + 0.2^2}$
- with $-41Q/p_T^2$ correction to dX, $-1.86 \sin(\phi_0 + 0.23)$ correction for dX in wedges 21-23, 0-5

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Results: pull average and error profile vs pt

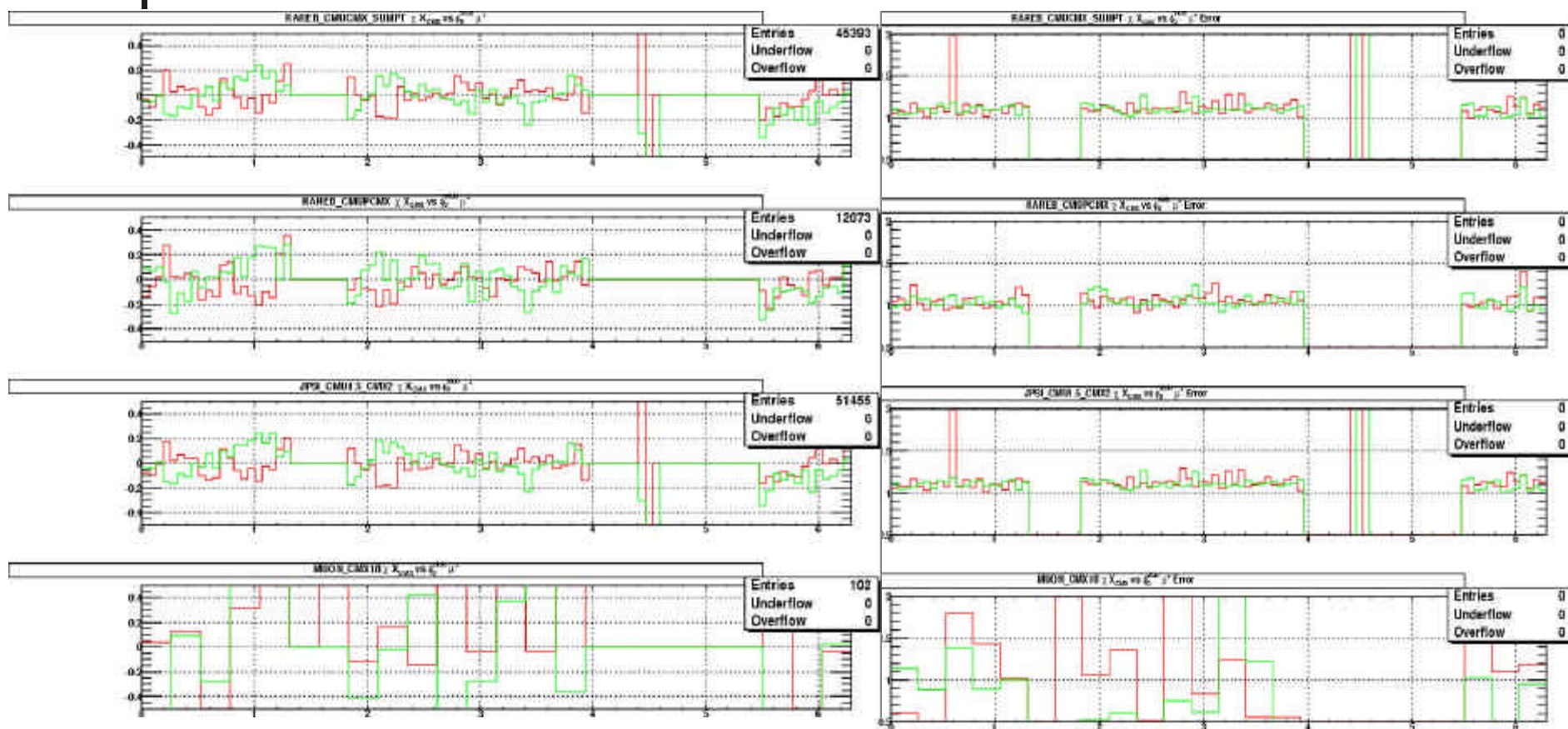


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Results: pull average and error profile vs phi

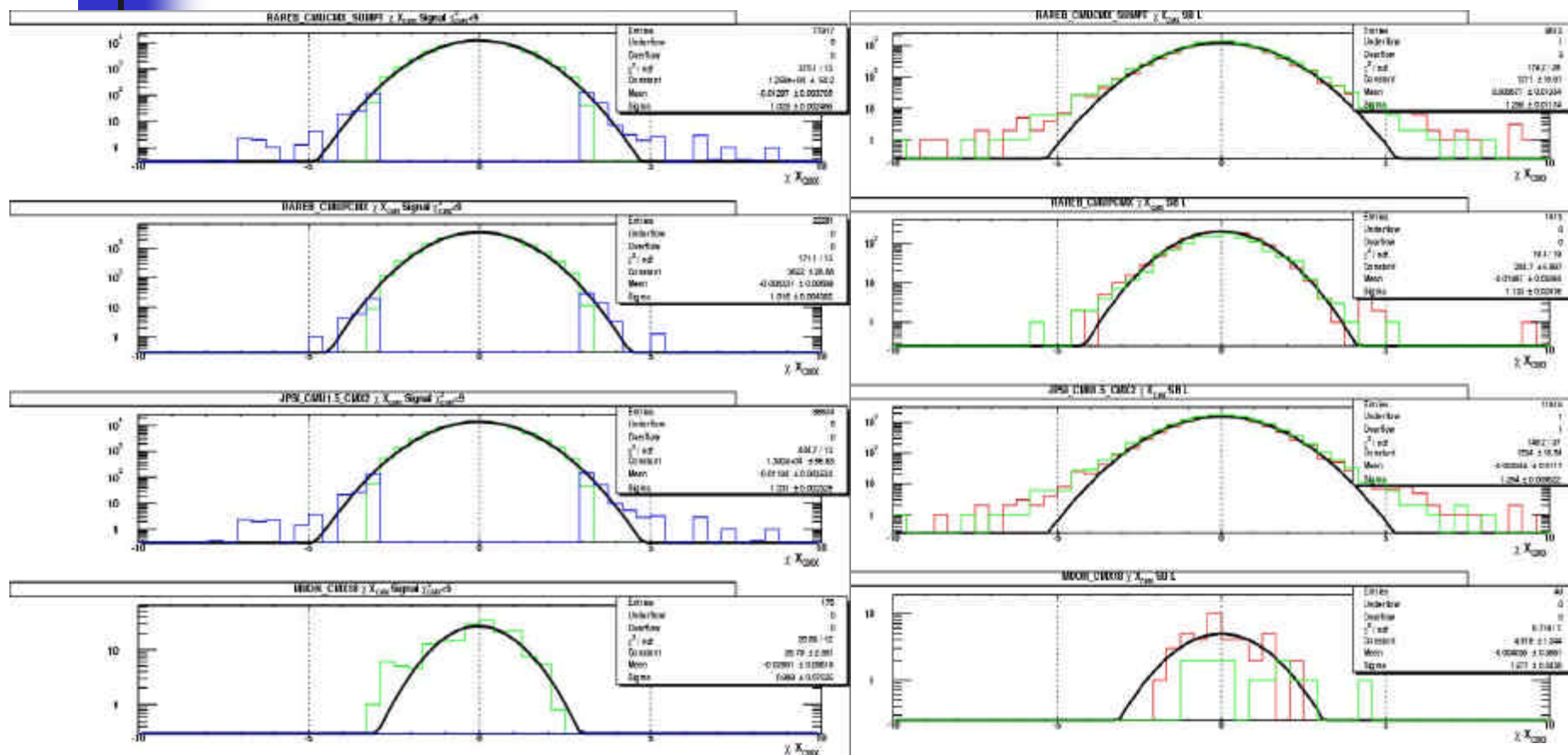


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Results: pull inclusive, fit. Signal and sidebands.

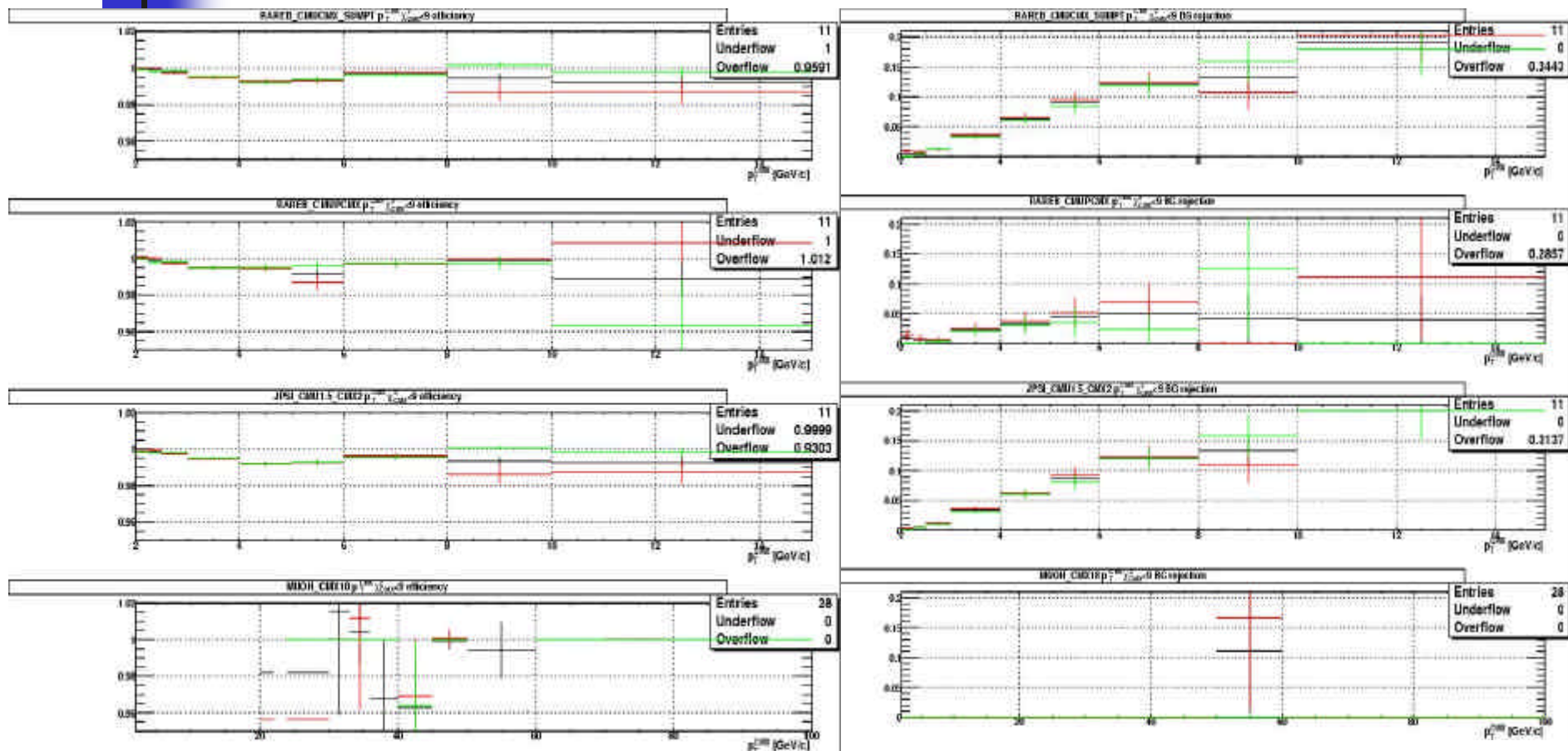


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Results: efficiency and rejection of $\chi^2 < 9$ cut.



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Summary/Plans

- dX error parameterization performed provides an (ultimately) centered at 0 pull distribution of width 1 with a good gaussian fit for signal events.
- $\text{Chi}^2 < 9$ cut gives efficiency ~ 99.5 for J/psi spectrum
- High pt $\text{chi}^2 < 9$ cut efficiency is limited by statistics.
 - gives $\sim 97\%$ for Z.
 - chi^2 quality here is dominated by misalignment and extrapolation offset (results from a complex geometry in the region).